REMARKS/ARGUMENTS

Reconsideration and withdrawal of the rejections of the application are respectfully requested in view of the amendments and remarks herewith. The present amendment is being made to facilitate prosecution of the application.

I. STATUS OF THE CLAIMS AND FORMAL MATTERS

Claims 1, 2, 4-11, 29-38 and 55-58 are pending. Claim 3 has been canceled without prejudice or disclaimer of subject matter. Claims 1, 6, 9, 29, 31, 35, 37, 55 and 57 are independent and hereby amended. No new matter has been added. It is submitted that these claims, as originally presented, were in full compliance with the requirements of 35 U.S.C. §112. Changes to claims are not made for the purpose of patentability within the meaning of 35 U.S.C. §101, §102, §103, or §112. Rather, these changes are made simply for clarification and to round out the scope of protection to which Applicants are entitled.

II. SUPPORT FOR AMENDMENT IN SPECIFICATION

Support for this amendment is provided throughout the Specification as originally filed and specifically at paragraphs [0095]-[0098] of Applicants' corresponding published application. By way of example and not limitation:

> [0095] FIG. 4 shows a configuration of the characteristic amount detection unit 30. The characteristic amount detection unit 30 detects characteristic amounts about a magnitude and periodicity of movement of the audience 60, a volume and periodicity of the sound including voice, and a frequency component of the sound at the audience 60 side.
>
> [0096] A movement amount detection unit 31 of the characteristic amount detection unit 30 detects characteristic amount 301 showing a magnitude of movement. A movement periodicity detection unit 32 detects characteristic amount 302 showing periodicity of movement. A power spectrum detection unit 34 detects characteristic amount 303 about a frequency component of sound. A volume detection unit 35 detects characteristic amount 304 showing a volume of sound. A sound periodicity detection unit 36 detects characteristic amount 305 showing periodicity of sound.
>
> [0097] FIG. 5 shows a configuration of the movement amount detection unit 31. A flesh-color area extraction unit 311 discriminates a pixel range capable of identifying flesh color in an RGB color

space, a YIQ color space or an HSV color space. For example, in the RGB color space, threshold values showing a red signal range, a green signal range, and a blue signal range, which identify flesh color, are set to discriminate, for each pixel, whether the signal levels of three primary-colors signals generated based on the video signal 211 are within the area of flesh color or not, thereby extracting the pixel range (hereinafter, called a "flesh-color area") which can identify flesh color.

[0098] FIG. 6 shows an example of configuration of a movement vector calculation unit 312 of the movement amount detection unit 31. This movement vector calculation unit 312 includes a blocking unit 3121 and a movement vector computation unit 3122, for example, as shown in FIG. 6. The movement vector calculation unit 312 divides the extracted flesh-color area into blocks to calculate a movement vector of the flesh-color area for each of the blocks. For example, the face unit and the hand unit of the audience is a block, respectively, and then, block matching of an image with the next frame (or the previous frame) image is performed for each of the blocks. The movement direction and the movement amount when the images of the blocks are most matched with each other are movement vector MV. Two-dimensional movement vector Mvi is detected, as shown in Formula (1).

III. RESPONSE TO CLAIM OBJECTIONS

Claim 57 is hereby amended thereby obviating the claim objection and 101 issue.

IV. RESPONSE TO REJECTIONS UNDER 35 U.S.C. 35 U.S.C. §103(a)

Claims 1-55, 29-34 and 55-58 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over U.S. Patent No. 5,550,928 to Lu (hereinafter, merely "Lu") in view of U.S. Patent No. 7,266,771 to Tow (hereinafter, merely "Tow") and further in view of U.S. Patent No. 6,542,625 to Lee (hereinafter, merely "Lee").

Claims 6-10 and 35-37 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Lu in view of Tow in view of U.S. Patent No. 7,373,209 to Tagawa (hereinafter, merely "Tagawa") and further in view of Lee.

Claims 11 and 38 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Lu in view of Tow in view of Tagawa in view of Lee and further in view of WO 91/03912 to Stevens (hereinafter, merely "Stevens").

Claim 1 has been amended to incorporate features of claim 3, and other features as well.

Specifically, claim 1 recites, *inter alia*:

"...**wherein the movement amount detection device extracts a flesh-color area which identifies flesh color from said video signal, divides the flesh-color area into blocks identifying flesh color, and calculates movement vectors for each of the blocks identifying flesh color**..." (Emphasis added)

As understood by Applicants, Lee relates to a method of detecting a specified object in an image signal and more particularly to a detecting a specific object in a moving picture file.

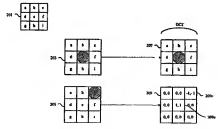
Applicants submit that neither Lu nor Tow nor Lee, taken alone or in combination, that would teach or suggest the above-identified features of claim 1. Specifically, none of the references used as a basis for rejection describes or suggests the movement amount detection device extracts a flesh-color area which identifies flesh color from said video signal, divides the flesh-color area into blocks identifying flesh color, and calculates movement vectors for each of the blocks identifying flesh color, as recited in claim 1.

Specifically, the Office Action (page 7, paragraph "Regarding claim 3...") asserts that Lu in view of Tow in view of Lee teaches when an area identified based on color information is divided into blocks, the movement vector is determined for each of the blocks, and refers to Tow, Fig.2 and col.8, lines 14-65, and Lee, col.5, lines 21-67, which are reproduced as follow:

> *Lee, col.4, line 56-col.5, line 67:*
> The system then judges if a movement of the object exists using the obtained image difference (step S303). ... For example, if the object is a human face, the system would judge if a face movement exists using the obtained image difference (step S303). If the face movement exists, the system would judge that the face does appear, search for a skin color image (step S304), and determine whether a skin color region exists (step S305).
> ... ...
>
> Thereafter, the color difference image is made into grid images of a predetermined size (step S307). The system divides pixels having binary values into blocks, and if any block includes more than a predetermined number of pixels with the value of "1," the system determines the value of the corresponding block as "1." Otherwise, the system determines the value of the block as "0." By the above process, the system obtains the grid image information. The system then determines connected regions of a same value using the grid images (step S308). In other words, the system obtains connected regions of grids having values of "1" in eight directions, namely grids in the upper, lower, right, left and diagonal directions having the value of "1..."

Tow, col.8, lines 14-65:
FIG. 2 is a diagrammatic representation showing motion information associated with an MPEG bit stream that can be processed. A frame of video is shown as frame 201. The frame 201 has blocks 201a-201i. Each block can represent a number of pixels in an image. For example, a frame having 9 blocks each 10.times.10 pixels in size would contain 900 pixels and have a resolution of 30.times.30. FIG. 2 shows two sequential frames of a ball in a video sequence encoded as an image frame and as a differential frame containing motion vectors.

Figure 2



Thus, Applicants submit that Lee describes searching for a skin color image and determining whether a skin color region exist, and Tow describes that the frame 201 in Fig. 2 has blocks 201a-201i, but neither of Lee and Tow teaches extracting the skin color region and dividing the extracted skin color region into blocks identifying skin color.

However, in the present invention, paragraphs [0095]-[0098] of Applicants' corresponding published application, describe extracting a flesh-color area and dividing the flesh-color area into blocks identifying flesh color, and calculating movement vectors for each of these blocks, and are reproduced as follow:

> [0095] FIG. 4 shows a configuration of the characteristic amount detection unit 30. The characteristic amount detection unit 30 detects characteristic amounts about a magnitude and periodicity of movement of the audience 60, a volume and periodicity of the sound including voice, and a frequency component of the sound at the audience 60 side.
>
> [0096] A movement amount detection unit 31 of the characteristic amount detection unit 30 detects characteristic amount 301 showing a magnitude of movement. A movement periodicity detection unit 32 detects characteristic amount 302 showing periodicity of movement. A power spectrum detection unit 34 detects characteristic amount 303 about a frequency component of sound. A volume detection unit 35 detects characteristic amount 304 showing a volume of sound. A sound periodicity detection unit 36 detects characteristic amount 305 showing periodicity of sound.
>
> [0097] FIG. 5 shows a configuration of the movement amount detection unit 31. A flesh-color area extraction unit 311 discriminates a pixel range capable of identifying flesh color in an RGB color space, a YIQ color space or an HSV color space. For example, in the RGB color space, threshold values showing a red signal range, a green signal range, and a blue signal range, which identify flesh color, are set to discriminate, for each pixel, whether the signal levels of three primary-colors signals generated based on the video signal 211 are within the area of flesh color or not, thereby extracting the pixel range (hereinafter, called a "flesh-color area") which can identify flesh color.
>
> [0098] FIG. 6 shows an example of configuration of a movement vector calculation unit 312 of the

movement amount detection unit 31. This movement vector calculation unit 312 includes a blocking unit 3121 and a movement vector computation unit 3122, for example, as shown in FIG. 6. The movement vector calculation unit 312 divides the extracted flesh-color area into blocks to calculate a movement vector of the flesh-color area for each of the blocks. For example, the face unit and the hand unit of the audience is a block, respectively, and then, block matching of an image with the next frame (or the previous frame) image is performed for each of the blocks. The movement direction and the movement amount when the images of the blocks are most matched with each other are movement vector MV. Two-dimensional movement vector Mvi is detected, as shown in Formula (1).

FIG. 4

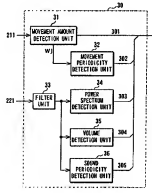


FIG. 5

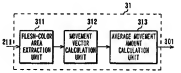
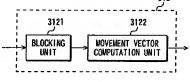


FIG. 6



Thus, in the present invention, flesh-color area extraction unit 311 discriminates a pixel range capable of identifying flesh color, and then movement vector calculation unit 312 divides the extracted flesh-color area into blocks to calculate a movement vector of the flesh-color area for each of the blocks. For example, the face unit and the hand unit of the audience is a block, respectively.

Thus, nothing has been found in Lee and Tow that would teach or suggest the movement amount detection device extracts a flesh-color area which identifies flesh color from said video signal, divides the flesh-color area into blocks identifying flesh color, and calculates movement vectors for each of the blocks identifying flesh color, as recited in claim 1.

Furthermore, this deficiency of Lee and Tow is not cured by the supplemental teaching of Lu or Tagawa.

Therefore, Applicants respectfully submit that claim 1 is patentable.

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For reasons similar to those described above with regard to independent claim 1, the independent claims 6, 9, 29, 31, 35, 37, 55 and 57 are also patentable.

V. DEPENDENT CLAIMS

The other claims are dependent from an independent claim, discussed above, and are therefore believed patentable for at least the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

Similarly, because Applicants maintain that all claims are allowable for at least the reasons presented hereinabove, in the interests of brevity, this response does not comment on each and every comment made by the Examiner in the Office Action. This should not be taken as acquiescence of the substance of those comments, and Applicants reserve the right to address such comments.

CONCLUSION

In the event the Examiner disagrees with any of the statements appearing above with respect to the disclosures in the cited reference, or references, it is respectfully requested that the Examiner specifically indicate the portion, or portions, of the reference, or references, providing the basis for a contrary view.

Please charge any additional fees that may be needed, and credit any overpayment, to our Deposit Account No. 50-0320.

In view of the foregoing amendments and remarks, it is believed that all of the claims in this application are patentable and Applicants respectfully request early passage to issue of the present application.

Respectfully submitted,

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